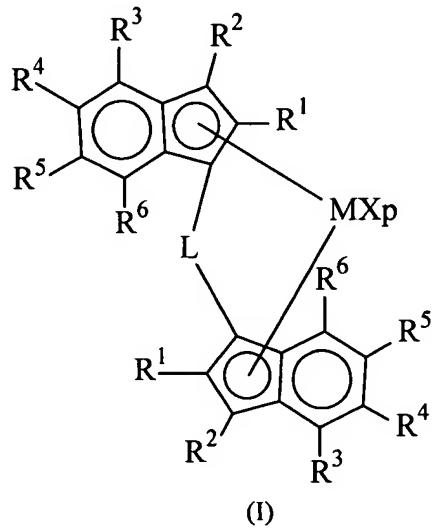


AMENDMENTS TO THE CLAIMS

1. (currently amended) A process for preparing 1-butene polymers optionally containing up to 30% by mol of derived units of ethylene, propylene or an alpha olefin of formula $\text{CH}_2=\text{CHZ}$, wherein Z is a $\text{C}_3\text{-C}_{10}$ alkyl group, comprising polymerizing 1-butene and optionally ethylene, propylene or said alpha olefin, in the presence of a catalyst system obtained by contacting:

a) at least a metallocene compound of formula (I):



wherein:

M is an atom of a transition metal selected from those belonging to group 3-4, 5, 6 or to the lanthanide or actinide groups in the Periodic Table of the Elements;

p is 2, being equal to the formal oxidation state of the metal M minus 2;

X, equal to or different from each other, are hydrogen atoms, halogen atoms, or R, OR, OSO_2CF_3 , OCOR, SR, NR₂ or PR₂ groups, wherein R is a linear or branched, **saturated or unsaturated** $\text{C}_1\text{-C}_{20}$ alkyl, $\text{C}_3\text{-C}_{20}$ cycloalkyl, $\text{C}_6\text{-C}_{20}$ aryl, $\text{C}_7\text{-C}_{20}$ alkylaryl or $\text{C}_7\text{-C}_{20}$ arylalkyl radical, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements; or a OR'O group wherein R' is a divalent radical selected from $\text{C}_1\text{-C}_{20}$ alkylidene, $\text{C}_6\text{-C}_{40}$ arylidene, $\text{C}_7\text{-C}_{40}$ alkylarylidene **and/or** $\text{C}_7\text{-C}_{40}$ arylalkylidene radicals;

R¹, equal to or different from each other, are linear or branched, **saturated or unsaturated** $\text{C}_1\text{-C}_{20}$ -alkyl, $\text{C}_3\text{-C}_{20}$ -cycloalkyl, $\text{C}_6\text{-C}_{20}$ -aryl, $\text{C}_7\text{-C}_{20}$ -alkylaryl or

C_7-C_{20} -arylalkyl radicals, optionally containing at least one heteroatom belonging to groups 13-17 of the Periodic Table of the Elements;

R^2 , R^3 and R^6 , equal to or different from each other, are hydrogen atoms or linear or branched, saturated or unsaturated C_1-C_{20} -alkyl, C_3-C_{20} -cycloalkyl, C_6-C_{20} -aryl,

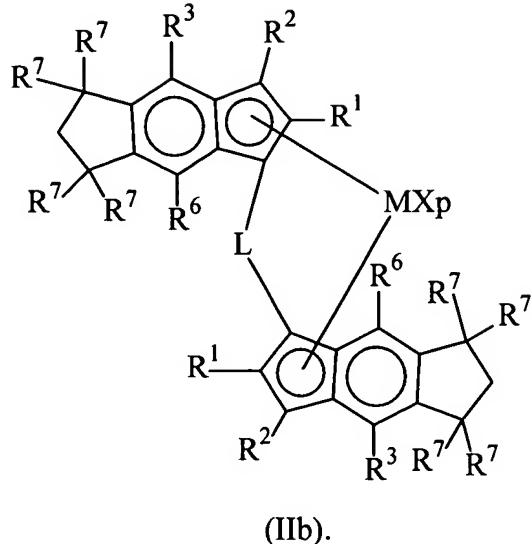
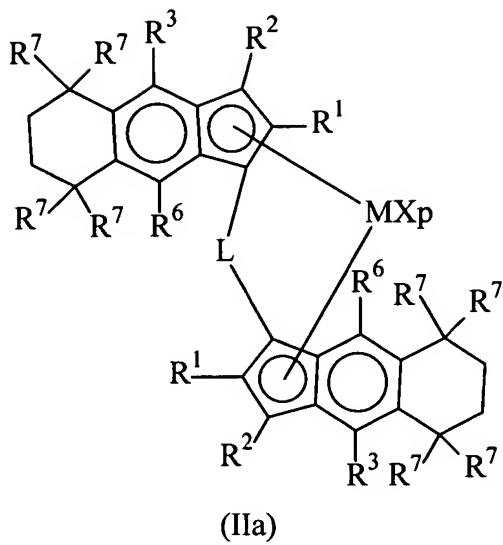
C_7-C_{20} -alkylaryl or C_7-C_{20} -arylalkyl radicals, optionally containing at least one heteroatom belonging to groups 13-17 of the Periodic Table of the Elements;

R^4 and R^5 , form together a condensed saturated or unsaturated C_3-C_7 membered ring optionally containing heteroatoms belonging to groups 13-16 of the Periodic Table of the Elements; every atom forming said ring being substituted with R^7 radicals wherein R^7 , equal to or different from each other, are hydrogen atoms or linear or branched, saturated or unsaturated C_1-C_{20} -alkyl, C_3-C_{20} -cycloalkyl, C_6-C_{20} -aryl, C_7-C_{20} -alkylaryl or C_7-C_{20} -arylalkyl radicals, optionally containing at least one heteroatom belonging to groups 13-17 of the Periodic Table of the Elements;

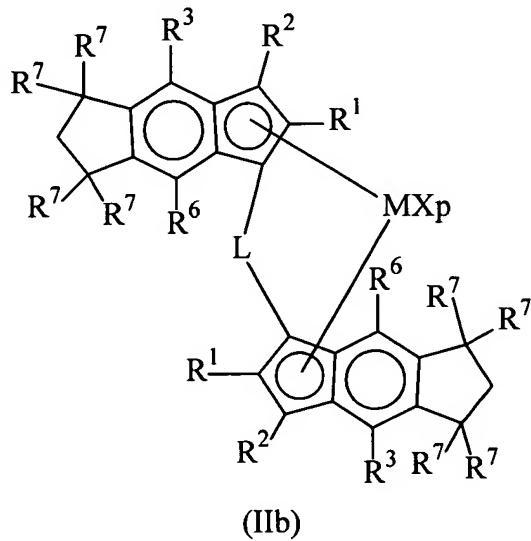
L is a divalent bridging group selected from C_4-C_{20} -alkylidene, C_3-C_{20} -cycloalkylidene, C_6-C_{20} -arylidene, C_7-C_{20} -alkylarylidene, or a C_7-C_{20} -arylalkylidene radical optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements, or a silylidene radical containing up to 5 silicon atoms $Si(R^8)_2$ wherein R^8 is a linear or branched, C_1-C_{20} -alkyl, C_3-C_{20} -cycloalkyl, C_6-C_{20} -aryl, C_7-C_{20} -alkylaryl or C_7-C_{20} -arylalkyl radical; and

b) an alumoxane or a compound that forms an alkylmetallocene cation.

2. (original) The process according to claim 1 wherein the catalyst system further comprises an organo aluminum compound.
3. (currently amended) The process according to claim 1, wherein in the compound of formula (I), M is titanium, zirconium or hafnium; and X is a hydrogen atom, a halogen atom or an R group and L is $Si(R^8)_2$, wherein R^8 is a linear or branched, saturated or unsaturated C_4-C_{20} -alkyl, C_3-C_{20} -cycloalkyl, C_6-C_{20} -aryl, C_7-C_{20} -alkylaryl or C_7-C_{20} -arylalkyl radical.
4. (currently amended) The process according to claim 1 wherein R^1 is a C_1-C_{20} -alkyl radical; R^2 , R^3 and R^6 are hydrogen atoms and R^7 is a hydrogen atom or a linear or branched, saturated or unsaturated C_1-C_{20} -alkyl radical.
5. (previously presented) The process according to claim 1 wherein the compound of formula (I) has formula (IIa) or (IIb):



6. (previously presented) The process according to claim 1 wherein 1-butene is homopolymerized.
7. (currently amended) A metallocene compound of formula (IIb):



wherein

M is an atom of a transition metal selected from those belonging to group 3, 4, 5, 6 or to the lanthanide or actinide groups in the Periodic Table of the Elements;

p is 2, being equal to the formal oxidation state of the metal M minus 2;

L is a divalent bridging group selected from C_4-C_{20} alkylidene, C_3-C_{20} cycloalkylidene, C_6-C_{20} arylidene, C_7-C_{20} alkylarylidene, or a C_7-C_{20} arylalkylidene radical optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements, or a

silylidene radical containing up to 5 silicon atoms $\text{Si}(\text{R}^8)_2$ wherein R^8 is a linear or branched, $\text{C}_1\text{-C}_{20}\text{-alkyl}$, $\text{C}_3\text{-C}_{20}\text{-cycloalkyl}$, $\text{C}_6\text{-C}_{20}\text{-aryl}$, $\text{C}_7\text{-C}_{20}\text{-alkylaryl}$ or $\text{C}_7\text{-C}_{20}\text{-arylalkyl}$ radical;

R^1 , equal to or different from each other, are linear or branched, saturated or unsaturated $\text{C}_1\text{-C}_{20}\text{-alkyl}$, $\text{C}_3\text{-C}_{20}\text{-cycloalkyl}$, $\text{C}_6\text{-C}_{20}\text{-aryl}$, $\text{C}_7\text{-C}_{20}\text{-alkylaryl}$ or $\text{C}_7\text{-C}_{20}\text{-arylalkyl}$ radicals, optionally containing at least one heteroatom belonging to groups 13-17 of the Periodic Table of the Elements;

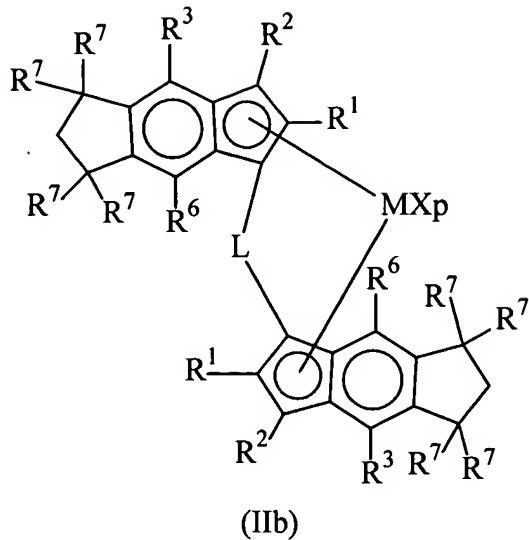
R^2 , R^3 and R^6 , equal to or different from each other, are hydrogen atoms or linear or branched, saturated or unsaturated $\text{C}_1\text{-C}_{20}\text{-alkyl}$, $\text{C}_3\text{-C}_{20}\text{-cycloalkyl}$, $\text{C}_6\text{-C}_{20}\text{-aryl}$, $\text{C}_7\text{-C}_{20}\text{-alkylaryl}$ or $\text{C}_7\text{-C}_{20}\text{-arylalkyl}$ radicals, optionally containing at least one heteroatom belonging to groups 13-17 of the Periodic Table of the Elements;

R^7 , equal to or different from each other, are hydrogen atoms or linear or branched, saturated or unsaturated $\text{C}_1\text{-C}_{20}\text{-alkyl}$, $\text{C}_3\text{-C}_{20}\text{-cycloalkyl}$, $\text{C}_6\text{-C}_{20}\text{-aryl}$, $\text{C}_7\text{-C}_{20}\text{-alkylaryl}$ or $\text{C}_7\text{-C}_{20}\text{-arylalkyl}$ radicals, optionally containing at least one heteroatom belonging to groups 13-17 of the Periodic Table of the Elements;

X , equal to or different from each other, are hydrogen atoms, halogen atoms, or R , OR , OSO_2CF_3 , OCOR , SR , NR_2 or PR_2 groups, wherein R is a linear or branched, saturated or unsaturated $\text{C}_1\text{-C}_{20}$ alkyl, $\text{C}_3\text{-C}_{20}$ cycloalkyl, $\text{C}_6\text{-C}_{20}$ aryl, $\text{C}_7\text{-C}_{20}$ alkylaryl or $\text{C}_7\text{-C}_{20}$ arylalkyl radical, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements; or a $\text{OR}'\text{O}$ group wherein R' is a divalent radical selected from $\text{C}_1\text{-C}_{20}$ alkylidene, $\text{C}_6\text{-C}_{40}$ arylidene, $\text{C}_7\text{-C}_{40}$ alkylarylidene and $\text{C}_7\text{-C}_{40}$ arylalkylidene radicals.

8. (cancelled)

9. (currently amended) A process for preparing a metallocene compound of formula (IIb):



wherein

M is an atom of a transition metal selected from those belonging to group-3, 4, 5, 6 or to the lanthanide or actinide groups in the Periodic Table of the Elements;

p is 2, being equal to the formal oxidation state of the metal M minus 2;

L is a ~~divalent bridging group selected from C₄-C₂₀ alkylidene, C₃-C₂₀ cycloalkylidene, C₆-C₂₀ arylidene, C₇-C₂₀ alkylarylidene, or a C₇-C₂₀ arylalkylidene radical optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements, or a silylidene radical containing up to 5 silicon atoms Si(R⁸)₂ wherein R⁸ is a linear or branched, C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl or C₇-C₂₀-arylalkyl radical;~~

R¹, equal to or different from each other, are linear or branched, ~~saturated or unsaturated~~ C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl or C₇-C₂₀-arylalkyl radicals, optionally containing at least one heteroatom belonging to groups 13-17 of the Periodic Table of the Elements;

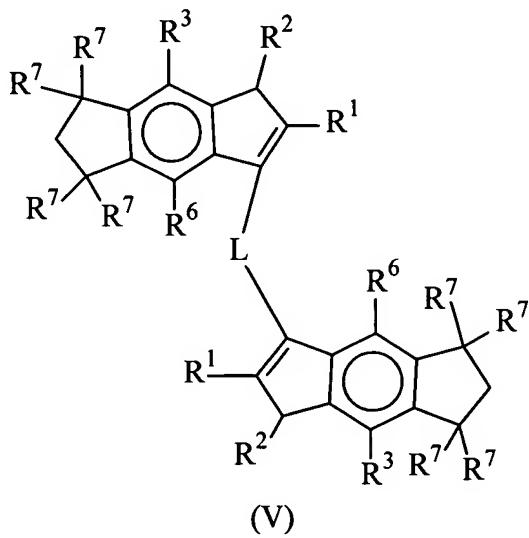
R², R³ and R⁶, equal to or different from each other, are hydrogen atoms or linear or branched, ~~saturated or unsaturated~~ C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl or C₇-C₂₀-arylalkyl radicals, optionally containing one or more heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements;

R⁷, equal to or different from each other, are ~~hydrogen atoms or~~ linear or branched, ~~saturated or unsaturated~~ C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl or C₇-C₂₀-arylalkyl radicals, optionally containing at least one heteroatom belonging to groups 13-17 of the Periodic Table of the Elements;

X, equal to or different from each other, are hydrogen atoms, halogen atoms, or R, OR, OSO₂CF₃, OCOR, SR, NR₂ or PR₂ groups, wherein R is a linear or branched, saturated or unsaturated C₁-C₂₀ alkyl, C₃-C₂₀ cycloalkyl, C₆-C₂₀ aryl, C₇-C₂₀ alkylaryl or C₇-C₂₀ arylalkyl radical, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements; or a OR'O group wherein R' is a divalent radical selected from C₁-C₂₀ alkylidene, C₆-C₄₀ arylidene, C₇-C₄₀ alkylarylidene and/or C₇-C₄₀ arylalkylidene radicals;

comprising the following steps:

a) contacting a ligand of formula (V)



or its double bond isomer

with a base of formula T_jB or TMgT¹, or sodium or potassium hydride, or metallic sodium or potassium; wherein B is an alkaline or alkali-earth metal and j is 1 or 2, j being equal to 1 when B is an alkaline metal, and j being equal to 2 when B is an alkali-earth metal; T is selected from the group consisting of linear or branched, saturated or unsaturated C₁-C₂₀ alkyl, C₃-C₂₀ cycloalkyl, C₆-C₂₀ aryl, C₇-C₂₀ alkylaryl or C₇-C₂₀ arylalkyl groups, optionally containing at least one Si or Ge atom; T¹ is a halogen atom or a group OR" wherein R" is a linear or branched, saturated or unsaturated C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl or C₇-C₂₀-arylalkyl radicals, optionally containing at least one heteroatom belonging to groups 13-17 of the Periodic Table of the Elements; wherein the molar ratio between said base and the ligand of the formula (V) and is at least 2:1; and

b) contacting the product obtained in step a) with a compound of formula MX₄.

10. (cancelled)
11. (cancelled)
12. (new) The process according to claim 5 wherein R⁷, equal to or different from each other, are linear or branched, C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl or C₇-C₂₀-arylalkyl radicals, optionally containing at least one heteroatom belonging to groups 13-17 of the Periodic Table of the Elements.
13. (new) The process according to claim 12 wherein formula I is formula IIa.
14. (new) The process according to claim 12 wherein formula I is formula IIb.